

Application No. 10/635,647
Amendment filed June 14, 2004
Reply to Office Action dated March 12, 2004

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REMARKS

Claims 1-5 are pending, with claim 1 being in independent form. Claims 3-5 are added by the present amendment.

In the Office Action, the specification is objected to for certain informalities. The Applicants have amended the specification in accordance with the Office's suggestions, and have corrected other minor typographical errors. Accordingly, the Applicants respectfully request that the Office reconsider and withdraw the objections.

Claims 1 and 2 stand rejected for anticipation separately by U.S. Patents No. 5,910,704 to Choo and No. 5,955,850 to Yamaguchi et al. ("Yamaguchi"). The Applicants believe the pending claims are allowable over the cited documents for the following reasons.

Anticipation requires that every feature of the claimed invention be shown in a single prior document. *In re Paulsen*, 30 F.3d 1475 (Fed. Cir. 1994); *In re Robertson*, 169 F.3d 743 (Fed. Cir. 1999). The pending claims positively recite features that are not described in either of the cited documents.

For example, claim 1 recites, among other things, "micro-tips having nano-sized surface features, formed on the cathode". The Office asserts that the recited feature reads on Choo's micro-tips 15 and on Yamaguchi's cone emitter 5. The Applicants respectfully disagree.

Neither Choo nor Yamaguchi expressly describe that the respective micro-tips 15 and cone emitter 5 have nano-sized surface features. Nor can the nano-sized surface features be said to be inherently described in the cited documents. To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

The Office does not specifically point out where in the cited documents the absent feature is expressly described. Nor does the Office carry its burden of proof in showing that the absent feature is inherent in the teachings of the documents. Accordingly, the Applicants respectfully request that the Examiner reconsider and

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withdraw the rejections of claim 1 based on Choo and Yamaguchi for at least this reason.

With respect to new claim 3, Choo and Yamaguchi do not describe micro-tips having nano-sized surface features, much less micro-tips comprising a plurality of nano-tips, as the claim recites. Support for new the claim can be found throughout the specification, and in particular on page 8, lines 15-28, of the specification, and in FIGS. 8-10.

The Applicants describe on page 8 of the application that the gate turn-on voltage of a field emission device (FED) according to some embodiments of the present invention is reduced by about 20V, and the working voltage (a voltage level at a 1/90 duty ratio and a 60Hz frequency) is lowered by about 40-50V, compared with a conventional FED. Reducing the working voltage, together with focus gate arrangement, can further reduce the risk of electrical arcing events occurring during operation of the FED. The Applicants further describe that the size of the nano-tips can be varied by adjusting the etching ratios or etching rates of the focus gate insulation layer to vary the required working voltage.

Accordingly, claim 3 is believed to be allowable over each of the cited documents for this reason as well.

With respect to new claims 4 and 5, neither Choo nor Yamaguchi describe a resistor layer formed beneath the cathode or resistors layers formed over and beneath the cathode. Support for the new claims can be found in originally filed claim 2. Accordingly, these claims are believed to be allowable for these reasons as well.

Finally, the Office cites U.S. Patent No. 5,850,120 to Okamoto as being pertinent to the Applicant's disclosure, but does not rely on the document to reject the claims. Nevertheless, the Office asserts that Okamoto discloses a field emission device that at least claim 1 reads on. The Applicants respectfully disagree.

In addition to the absent features discussed above, claim 1 recites, among other things, a cathode formed over a substrate and micro-tips having nano-sized surface features, formed on the cathode. Okamoto's arrangement includes only a cold cathode 1 arranged directly on the substrate 4. Okamoto's arrangement further lacks the absent features defined in claims 2-5 of the application identified above. Accordingly, the pending claims would be allowable over Okamoto as well, should

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the document be relied upon to support a rejection raised in a subsequently issued Action.

For the foregoing reasons, it is believed this application is in condition for allowance and an early Notice thereof is earnestly solicited. If any questions remain, the Examiner is invited to phone the undersigned at the below-listed number.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: 

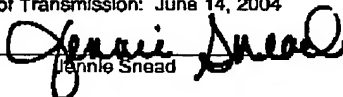
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